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ABSTRACT

This paper discusses one practical difficulty that emerges when teachers begin to construct learning modules: that most module developers make the error of becoming "course choppers" rather than "system builders." The paper is written for teachers who have begun the process of developing modules and have encountered organizational difficulties. The paper stresses learner reinforcement: the teacher must see how the pieces of the course will fit together and the learner must reinforce himself/herself through a selection of motivational experiences coordinated into a coherent system by the teacher. The paper is presented in a question and answer format. The questions are the types that teachers ask when presented with modular instruction as an alternative approach to teaching, and the answers are those developed by teachers to explain this approach to one another. (BD)

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TITLE

CORRECTING ONE PRACTICAL DIFFICULTY OF TEACHING WITH MODULES

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DATE

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CORRECTING ONE PRACTICAL DIFFICULTY OF TEACHING WITH MODULES

1. PURPOSE:

The purpose of this short article is to point out one practical difficulty that emerges when teachers begin to construct learning modules. In brief, this difficulty boils down to the fact that most module developers make the error of becoming course choppers rather than system builders.

2. READER OBJECTIVE:

This article is directed to teachers who have begun the process of developing modules. Many of these teachers find themselves in the predicament of a course chopper who has divided his course into a number of pieces which don't fit together.

3. A POINT OF VIEW:

The main arguement of this article is for learner reinforcement. This means that the teacher must foresee how the pieces of the course will fit together. This also means that it becomes the learner's job to reinforce himself through a selection of motivational experiences coordinated into a coherent system by his teacher.

4. ORGANIZATION:

Rather than develop an elaborate theoretical conceptualization, this article takes the form of a question and answer format. These questions are the types that teachers ask when presented to this basic approach. The answers are those answers developed by teachers to explain this approach to one another. For those interested in specific issues and situations, each question is followed by a commentary in parantheses that points the topic under discussion.

OVERVIEW

CORRECTING ONE PRACTICAL DIFFICULTY OF TEACHING WITH MODULES

The following sections treat modular instruction as one of the many options open to the innovative teacher. It treats modules as a "process" rather than as another way to cut up "subject matter."

The following questions sum up the steps in this process:

1. What is a module? (Module Definitions)
2. What's the typical module like? (Module Components)
3. Why do some modules fail the learner? (Module Deficiencies)
4. What does this imply for the construction of modules? (Guidelines for Module Builders)
5. What is the job of the module builder? (Contrast Between Module Building and Writing)
6. What is learner success in a module? (Modules and "Self-Developing" Learners)
7. What must the module builder do to succeed? (Gains Scores and Self-Evaluation)
8. Where does the reinforcement come from? (Modules at Home and on the Job)
9. How long should a module last? (Time Enough to Learn)
10. What is a relevant module? (Modules Affect Learners, Teachers, Department Heads, Curriculum Coordinators and Administrators)

CORRECTING ONE PRACTICAL DIFFICULTY OF TEACHING WITH MODULES

1. What is a module?

A module is a self-standing sub-system of objectives, evaluations, and resources that enable a teacher to teach and a learner to learn in the most efficient manner possible.

A module is called self-standing because whether it lasts one week, two weeks, or six weeks, it is complete in itself. A module tends to specialize in one particular aspect of learning. Rather than try to cover the entire spectrum of available topics, a module tries to concentrate on two or three aspects. Rather than remain theoretical, a module tries to concentrate on visible objectives.

Objectives are understood to mean things students can do as a result of of the learning process. This stress on learnable objectives enables the teacher to specify for the learner exactly what should be his "gains score" or visible improvement at the end of an instructional period.

The determination of how much the learner has acquired in a course is the role of evaluation guided by "gains scores." The evaluation component of a module consists of such things as pretest, progress test, and posttest. These enable the learner to keep score in a very simple and uncomplicated fashion.

In order to obtain good results, a module not only provides a measurement of objectives attained in evaluation, it also provides resources or the means to get there. Resources point out the many roads between the start and finish of the learning process. They specify what the learner can learn. They include instructional media the teacher can use to facilitate this transition from ignorance to knowledge, from inexperience to skill, and from indifference to a good attitude.

MODULE DEFINITIONS

Module →	A self-standing sub-system of objectives, evaluations, and resources.
Self-standing	Able to be used for classroom instruction and self-instruction with or without a highly specialized teacher or instructor.
Subsystem	A group of closely knit objectives (targets), evaluations (tests), and resources (technology), that (a) can be learned as a unit and that (b) can be assembled together with other modules to form larger learning components.
Learnable objectives →	Precise educational goals that can be mastered by anyone possessing minimum aptitude.
Aptitude	The ability to learn: sometimes called general intelligence (to learn anything); at other times, called specific intelligence (e.g. to learn math or reading.)
Minimum Aptitude	The ability to learn possessed by those whose ability to learn is over the bottom 5th percentile when comparing all learners.
Unlearnable objectives	Precise educational goals that can be mastered by only the upper 5th percentile of human intelligence in a reasonable period of time.
Gains Score →	Visible improvement made by any learner as he makes progress from his initial learning benchmark at the start of any learning period.
Sequential	Building upon previously achieved objectives.
Complexity	A learning objective that has built upon previously attained objectives in such a way as to denote a mastery skill of the highest level.

2. What's the typical module like?

The typical school year is divided into two semesters: the first semester and the second semester. The typical high school course lasts for either one or two semesters.

A module is a bit different. Think of a typical one semester course. Chop it up into five or six parts. After you have done this, you will find you have five or six modules if each part is self-standing.

Make note that a module does not chop up a course merely according to time. It subdivides subject matter in such a way as to stress related objectives. It tries to put together related basic skills. If a half dozen skills are sequential and build upon each other, they must also build upon each other in the module.

In practice this means that the first module of any school year contains all new material. It still tries to build upon the previous skills of the student from last year. But as far as the prerequisites are concerned, the first module contains all new material.

3. Why do some modules fail the learner?

Evaluation studies have shown one dangerous side effect of a module. If modules are so constructed that the first module of the school year contains all new material and the second module contains additional unrelated new material, the effect of lost learning sets in. This means that what the student learns in the first module is forgotten in the second module five or six weeks later unless the previous learnings are reinforced.

What does reinforcement mean? Let's give a simple example. If a student learns in module number 1 how to weld, he will do quite well on the posttest at the end of the module. He will have made visible progress from his pretest. If module 2 goes on to a different aspect of the curriculum and does not give the learner a chance to apply and practice his welding skills, the student will begin to forget. He will begin to lose skills previously gained.

Reinforcement is not a complicated process. The mere fact that the student who has learned to weld in September gets a chance to practice welding in October and January outside of a classroom situation leads to the pheonomenon we call reinforcement. Reinforcement means this: "If you do something successfully, you like it. You tend to do it better the next time." Lack of reinforcement means: "If you have learned to weld in September and you don't practice in October, November, and December, you begin to get rusty. Your welding skill falls off."

4. What does this imply for the construction of modules?

The last example shows what happened when no effort is made to reinforce the learner. Reinforcing the learner simply means giving him chances to practice what he has learned. Not everything learned has to be reinforced. But if a particular objective or skill is job-related, this basic attainment must [illegible]d over and over again until it becomes second nature.

Second nature means the student can do it almost without thinking. He is aware of the complexities involved. This is true because he has done them over and over again with understanding and success. These complexities are not as complex to him as they are to somebody who is inexperienced. An inexperienced person may be very intelligent but unless he has practiced the particular skill in question, he will not be able to function on the high level of complexity that comes from reinforcement. Within reason, the more you do something the better you learn how to do it. If it is a complex skill, you will find out that repeating it over and over again in a variety of circumstances gives you the ease of a good habit.

5. What is the job of the module builder?

The task of the module builder can be over-simplified. We started off the first example of a module by saying that we divided a typical course into six segments. Obviously, this is not all we must do for a self-standing module. The course must be divided into segments of similar objectives, skills, and attitudes which can be assembled together. This is the first task in building a module.

An important task in module building is setting priorities. This means that the teacher must ask himself, "What is most important? What must be learned by the students? What must be reinforced throughout the school year? What can they not afford to forget?"

The answers to these questions give direction to the teacher. The most important goals in the curriculum are presented in the beginning of the school year. They are presented in very general fashion. The learner gets all the time he needs to build up these basic skills to an acceptable level. By the end of the last module, the learner should have built up his skills to the level that is necessary for eventual mastery. This means that he knows what to do with the first steps of some very complex operations.

The first task of a module builder is to make the module "self-standing." The second task is to make the learner "self-developing." The second task is a great deal easier when the school makes sure that enough linking pins have been built into the curriculum. One of the best linking pins available is "reinforcement." It is easy to use and quite effective.

6. What is learner success in a module?

It's not enough in an occupational course to pass the module posttest with a successful score. This newly acquired skill is merely a beginning. Each skill must be reinforced by on-the-job success. This often means practicing it over and over again until the learner can do it without the difficulty that characterizes the beginner. A student who has reached this level of success is ready to move on. He has learned the basic fundamentals. He knows what to do with himself. He can put these fundamentals together into a variety of patterns that will enable him to succeed in school and, more importantly, to succeed on the job.

7. What must the module builder do to succeed?

This attention to reinforcement is the often forgotten task of the module builder. After the curriculum has been divided, the teacher must be certain that the important objectives of the course are stressed in the first module. In other modules that develop secondary objectives, the teacher must not forget that "Repetition with enough variety to be interesting is the mother of learning."

In this way, students will become self-evaluators. They can tell when they have done a good job. They will also become motivated learners. They are out to do a better job in other areas which they have not yet had the chance to explore.

8. Where Does the Reinforcement Come From?

Teachers ask this question to find out what they should do to help learners. They want to be sure they have done all they can be expected to do. This is a valid approach since the teacher can be a good source of effective reinforcement.

Those seeking answers to this question often find that in certain curriculum areas the learner's life style is the best available source of practicing and retaining what he has learned. For example, teacher-centered resource activities (e.g. repetition, review, and practice) in agriculture do not reinforce learning in "farm boys and girls" as much as applying new skills back home. This emphasizes the obvious truth that reinforcing a psychomotor skill is not the same as recalling its cognitive counterpart. Memory doesn't always lead to skill development and all the expertise skill implies. The path from memory to skill is not an easy road to tread. It's an uphill climb. The path from skill to memory is easier and faster. Its speed comes from going downhill. Its ease comes from the fact that non-verbal skill doesn't require verbal filters that can slow down the learner whose psychomotor intelligence outwieghs his verbal fluency intelligence.

When a learner's life style or local environment doesn't provide built-in reinforcement for what he's learning in school, the teacher must step in. The role of the teacher need not be that of the sole source of reinforcement. For example, in a city with a wide variety of part-time job opportunities, a wide variety of skills learned in school can be practiced, perfected, tuned up, and reinforced on the job. Part of this development will be updating basic skill levels; other parts will stress new skills and tying things together.

9. How Long Should a Module Last?

The module is an attempt to divide the traditional eighteen week semester into a number of manageable and inter-exchangeable self-standing learning packages. When much emphasis is given to administrative scheduling convenience, modules tend to assume the phenomenon of "standardized length." This means that instead of placing the highest priority on varying and individulized learning time, the school decrees that each module will last exactly three weeks, six weeks, or some other supposedly magic number.

This convenient way to schedule instructional time and classroom assignments is an acceptable solution as long as it does presume "uniform results" in each learner. "Non-uniform results" means that in any given three week period, all else being equal, 22 learners will attain 22 different levels of achievement. "Individualized results" means that out of 19 different learners in any given three week period, 10 will finish a particular three week module, 4 will finish less than one three week module, and 5 will finish more than one three week module. In the same group and under the same conditions, 1 or 2 learners may accomplish as many as three or four three week modules. This is simply an example of the truism that learning rates do vary.

Modules should last long enough for an individual learner to attain those module goals relevant to his unique requirements. The module that offers a choice of objectives and a hierarchy of levels of attainment has gone a long way to foster this appropriate timing, regardless of whether or not, it is standardized or open-ended in the length of learning time specified.

10. What Is a Relevant Module

Making a module more meaningful is a task that is being done everyday by every teacher who asks, "How well am I achieving what I'm trying to do?" This evaluation points the finger at the next thing to be improved. This type of feedback provides the individual, whether teacher or learner, with a variety of alternatives from which to choose.

Learners want to:

- discover what choices are available (KNOWLEDGE, GOALS, AND TARGETS)
- find out what new performance they can acquire (SKILL GOALS)
- be convinced that the learning process is worthwhile in terms of specific payoffs (ATTITUDE GOALS)
- keep score on how well they are doing (EVALUATION AND TESTS)
- choose from a variety of ways of getting to desired goals (RESOURCES AND TECHNOLOGY)

Teachers want to:

- do more than talk as their role (TECHNOLOGY)
- get learners involved in course relevance (TARGETS)
- prove what a good job they're doing (TESTS)

Department Heads want to achieve feedback and interaction as an antidote to overspecialization and ivory tower isolation.

Curriculum Coordinatiors want to stress planning and quality control rather than letting things develop in an uncoordinated and cancerous fashion.

Administrators want hard data to present to the tax-paying public that the school is "doing its job."

CONCLUSIONS

Thus far, this article has focused on a question and answer format. This approach has been used to approach the difficulty of learner reinforcement from a number of facets. Each question and the accompanying answer have been presented in such a way as to focus on the need for each learner to experience success with modules.

For a teacher to set up a modular system of learning means more than physical changes such as course chopping, objective, diagnostic pretest, alternative learning environments, mastery posttest, nooks and crannies filled with books and materials, plants, animals, laboratory space, and the like.

There is more: This includes the extremely important element of personal change on the part of the teacher. A teacher changing classroom instruction from a traditional to a modular one experiences a change that goes beyond mere materials or techniques.

This is the change in the whole spirit of the classroom which is transformed from traditional, teacher-direct instruction to the teacher as a resource person assisting learning in a more informal, independent, and non-cohersive environment. The result of introducing modules into the classroom permits the class to become a very different place where both teacher and student can exist as total human beings reacting and interacting effectively with one another. The module, from this point of view, is another tool for humanizing education.